CLAIMS

1. An electrosurgical apparatus adapted to perform electrosurgery at an operative site on a patient, comprising:

a source of environmental gas providing gas molecules having properties for being energized at a particular frequency to an excited state. first delivery apparatus coupled to the source of gas and adapted to deliver the gas molecules into proximity with the operative site;

a laser adapted to produce a laser beam providing laser energy at a frequency equal to about an integer multiple of the particular frequency of the environmental gas, and at a power generally sufficient to excite the gas molecules:

second delivery apparatus coupled to the laser for delivering the laser beam along a pathway leading toward the operative site;

an electrosurgery generator providing electrosurgical power; and

third delivery apparatus coupled to the electrosurgery generator and adapted to deliver the electrosurgical power along the pathway toward the operative site.

2. The electrosurgical apparatus recited in Claim 1, wherein the laser energy is provided in an amount generally insufficient to ionize the gas molecules along the pathway.

3. The electrosurgical apparatus recited in Claim 2, wherein the electrosurgical power is provided in an amount generally sufficient to ionize the gas molecules excited by the laser.

4. The electrosurgical apparatus recited in Claim 1, wherein:

the source of gas provides molecules of a first gas; and

the laser has properties for generating the laser energy in an environment containing molecules of a second gas.

5. The electrosurgical apparatus recited in Claim 4, wherein the first gas contains molecules of the second gas.

6. The electrosurgical apparatus recited in Claim 4, wherein the first gas and the second gas contain molecules of at least one of carbon dioxide, argon, and helium.

7. The electrosurgical apparatus recited in Claim 1, wherein the laser is a first laser and the laser beam is a first laser beam, and the apparatus further comprises:

a second laser having a second laser beam which converges with the first laser beam in proximity to the operative site on the patient.

8. The electrosurgical apparatus recited in Claim 7, wherein:

the first laser beam has properties including power, temperature, frequency, and cross sectional configuration; and

the second laser beam has properties including power, temperature, frequency, and cross sectional configuration, respectively; and

at least one of the properties of the first laser beam differs from the respective property of the second laser beam.

9. The electrosurgical apparatus recited in Claim 1, wherein:

the electrosurgical apparatus includes a handpiece with a housing; and

at least portions of the first delivery apparatus, second delivery apparatus, and third delivery apparatus are disposed within the housing of the handpiece.

10. The electrosurgical apparatus recited in Claim 1, further comprising:

a first jaw and an opposing second jaw;

the first delivery apparatus being disposed in the first jaw;

the second delivery apparatus being disposed in one of the first jaw and the second jaw; and

the third delivery apparatus being disposed in one of the first jaw and the second jaw.

11. An electrosurgical apparatus for performing laparoscopic electrosurgery at an operative site in the abdominal cavity of a patient, comprising the steps of:

a source of environmental shielding gas providing gas molecules having properties for being energized at a particular frequency to an excited state.

first delivery apparatus coupled to the source of gas and adapted to deliver the gas molecules into proximity with the operative site;

a laser adapted to produce a laser beam providing laser energy at a frequency equal to about an integer multiple of the particuiar frequency of the environmental gas, and at a power generally sufficient to excite the gas molecules.

second delivery apparatus coupled to the laser for delivering the laser beam along a pathway leading toward the operative site;

an electrosurgery generator providing electrosurgical power;

third delivery apparatus coupled to the electrosurgery generator and adapted to deliver the electrosurgical power along the pathway to the operative site.

a handpiece including a housing and an elongate probe extending from the housing; and

at least the third delivery apparatus extending through the probe of the handpiece.

12. The electrosurgery apparatus recited in Claim 11, wherein:

the second delivery apparatus extends through the probe of the handpiece.

13. The electrosurgery apparatus recited in Claim 12, wherein:

the first delivery apparatus extends through the probe of the handpiece.

14. The electrosurgery apparatus recited in Claim 11, wherein

the source of gas is disposed in the housing of the handpiece.

15. The electrosurgery apparatus recited in Claim 11, wherein

the laser is disposed in the housing of the handpiece.

16. The electrosurgery apparatus recited in Claim 11, wherein

the laser includes a battery and a laser generator powered by the battery.

17. The electrosurgery apparatus recited in Claim 16, wherein

the battery is rechargeable

18. The electrosurgery apparatus recited in Claim 15, wherein the source of gas is included in the housing of the handpiece.

19. A catheter having a proximal end and a distal end, the catheter being adapted to perform electrosurgery within a body conduit, comprising:

any elongate shaft extending to the distal end of the catheter;

a balloon carried by the shaft and being disposed generally at the distal end of the catheter, the balloon having a wall and being inflatable by an inflation gas having molecules excitable by a laser;

portions of the balloon defining at least one hole providing for a controlled release of the inflation gas from the balloon;

inflation apparatus for inflating the balloon with the inflation gas and for releasing a portion of the inflation gas through the at least one hole in the balloon;

laser apparatus including a light fiber disposed along the wall of the balloon, the fiber being adapted to release laser energy into the inflation gas to excite the molecules of the gas along a pathway; and

electrosurgical apparatus including an electrode disposed along the wall of the balloon, the electrode being adapted to release electrosurgical energy along the pathway and to perform the electrosurgery within the body conduit

20. The catheter recited in Claim 19, wherein the wall of the balloon has an inner surface, and the light fiber is disposed along the inner surface of the balloon wall.

21. The catheter recited in Claim 20, wherein the light fiber is a side-light fiber.

22. The catheter recited in Claim 19, wherein the wall of the balloon has an outer surface and the electrosurgical electrode is disposed along the outer surface of the balloon wall.

23. The catheter recited in Claim 22, wherein the light fiber of the laser apparatus is disposed along the outer surface of the balloon wall.

24. The catheter recited in Claim 19, wherein:

the hole portions of the balloon, the light fiber of the laser system, and the electrode of the electrosurgery system are disposed generally longitudinally of the shaft of the catheter.

25. The catheter recited in Claim 19, wherein the inflation gas has a excitation frequency and the laser energy of the laser apparatus has a discharge frequency equal to about an integer multiple of the excitation frequency.

26. An electrosurgical method for performing electrosurgery at an operative site on a patient, comprising the steps of:

providing a source of environmental gas molecules having an excitation frequency;

moving the gas molecules from the source into proximity with the operative site;

providing a laser having a laser beam with a frequency equal to about an integer multiple of the excitation frequency of the enviromental gas;

controlling the laser beam to provide power sufficient to excite the gas molecules generally along a pathway leading toward the operative site;

providing an electrosurgical generator having electrosurgical power; and

delivering the electrosurgical power along the pathway toward the operative site to perform the electrosurgery on the patient.

27. The electrosurgical method recited in Claim 26, wherein during the delivering step, includes the step of:

providing the electrosurgical energy with power sufficient to ionize the excited gas molecules along the pathway.

28. The electrosurgical method recited in Claim 26, further comprising the steps of:

insufflating the patient with a particular gas in a laparoscopic procedure; and

the step of providing a laser includes the step of generating the laser beam in a discharge laser including the particular gas.

29. The electrosurgical method recited in Claim 28, wherein the generating step includes the step of generating the laser beam in a carbon dioxide discharge laser.

30. The electrosurgical method recited in Claim 26, wherein the step of providing at least one laser comprises the steps of:

providing a first laser, having a first laser beam;

providing a second laser, having a second laser beam; and

converging the first laser beam and the second laser beam toward the operative site.

31. The electrosurgical method recited in Claim 26, wherein the step of delivering the electrosurgical power includes the step of delivering the electrosurgical power in a monopolar configuration.

32. The electrosurgical method recited in Claim 26, wherein the step of delivering the electrosurgical power includes the step of delivering the electrosurgical power in a bipolar configuration.

33. The electrosurgical method recited in Claim 26, further comprising the step of moving the laser beam relative to the patient.

34. The method recited in Claim 33, wherein the moving step includes the step of scanning the laser beam relative to the operative site.

35. The electrosurgical method recited in Claim 26, wherein the step of energizing the laser includes the step of pulsing the laser.

36. A laparoscopic method for performing electrosurgery at an operative site in the abdomen of a patient, comprising the steps of:

insufflating the abdomen with gas molecules having an excitation frequency;

exciting the gas molecules with a laser beam to form a pathway of excited molecules leading toward the operative site, the laser beam having a fundamental frequency or harmonic thereof equal to about the excitation frequency of the insufflation gas; and

delivering electrosurgical energy along the pathway of excited gas molecules to perform an electrosurgical operation at the operative site.

37. The electrosurgical method recited in Claim 36, further comprising a step of moving the laser beam relative to the patient.

38. The electrosurgical method recited in Claim 36, further comprising the step of focusing the laser beam at other than the operative site.

39. The electrosurgical method recited in Claim 37, wherein the moving step includes the step of scanning the laser beam to provide the pathway with a non-linear configuration.

40. The electrosurgical method recited in Claim 39, wherein the scanning step includes the step of scanning the laser beam to provide the pathway with a planar configuration.

41. This electrosurgical method recited in Claim 36, further comprising the step of pulsing the laser beam.

42. The electrosurgical method recited in Claim 41, further comprising the step of pulsing the electrosurgical energy.

43. An electrosurgical method for performing laparoscopic electrosurgery an operative site in the abdominal cavity of a patient, comprising the steps of:

insufflating the abdominal cavity with an insufflation gas having an excitation frequency;

lasing the insufflation gas at a lasing frequency, during the lasing step, exciting the gas molecules to form a pathway of excited gas molecules leading toward the operative site;

directing electrosurgical energy along the pathway of excited gas molecules toward the operative site; and

operating electrosurgically on the patient at the operative site.

44. The electrosurgical method recited in Claim 43, wherein the lazing frequency is dependent on the excitation frequency of the insufflation gas.

45. The electrosurgical method recited in Claim 44, wherein the lazing frequency is an integer multiple of the excitation frequency of the insufflation gas.

46. The electrosurgical method recited in Claim 43, further comprising the step of ionizing the excited gas molecules.

47. The electrosurgical method recited in Claim 46, wherein the lazing step includes the ionizing step.

48. The electrosurgical method recited in Claim 46, wherein the directing step includes the ionizing step occurs within the directing step.

49. The electrosurgical method recited in Claim 46, wherein the directing step includes the steps of:

providing the electrosurgery energy with first characteristics during the ionizing step and with second characteristics different than the first characteristics during the operating step.

50. A method for performing electrosurgery within a body conduit, comprising the steps of:

providing a catheter having a shaft with a proximal end and a distal end, and a balloon with a wall, the balloon being carried by the shaft generally at the distal end of the shaft;

inflating the balloon with a gas having molecules;

releasing a portion of the gas molecules from the balloon;

exciting the molecules of the inflation gas with laser energy to produce a pathway of excited gas molecules; and

introducing electrosurgical energy into the pathway to perform the electrosurgery within the body conduit.

51. The method recited in Claim 50, wherein the exciting step includes the step of providing a light fiber within the shaft of the catheter;

delivering the laser energy through the light fiber and into the gas to excite the molecules of the gas.

52. The method recited in Claim 51, wherein the delivery step includes the step of delivering the laser energy through the wall of the balloon and into the molecules of the gas.

53. The method recited in Claim 50, wherein the introducing step includes the steps of:

providing an electrosurgical electrode on the wall of the balloon; and

delivering the electrosurgical energy along the pathway to perform the electrosurgery within the body conduit.

54. The method recited in Claim 50, wherein:

the inflating step includes the step of inflating the balloon with an inflation gas having an excitation frequency; and

the exciting step includes the step of exciting the inflation gas with laser energy having a discharge frequency equal to about an integer multiple of the excitation frequency of the inflation gas.

55. An electrosurgical apparatus adapted to perform electrosurgery at an operative site on a patient, comprising;

an environmental gas having gas molecules with properties for being energized at an excitation frequency;

a laser disposed to introduce a laser beam into the shielding gas to excite but not ionize the environmental gas along a pathway leading to the operative site on the patient, the laser beam having a discharge frequency equal to about an integer multiple of the excitation frequency of the shielding gas; and

an electrosurgical generator disposed to create an electrosurgical arc along the pathway to perform the electrosurgery at the operative site on the patient.

56. The electrosurgical apparatus recited in Claim 55, wherein the laser has an active medium with the discharge frequency.

57. The electrosurgical apparatus recited in Claim 56, wherein the laser is a gas laser and the active medium is a gas.

58. The electrosurgical apparatus recited in Claim 56, wherein the laser is a solid state laser and the active medium is a crystal.

59. The electrosurgical apparatus recited in Claim 56, wherein the discharge frequency of the laser is tunable.

60. The electrosurgical apparatus recited in Claim 58, wherein the crystal is ruby.

61. The electrosurgical apparatus recited in Claim 57, wherein the gas is carbon dioxide.